THE CLAIMS

1. A method of processing a pixel of a digital image, the method comprising:

applying a tone mapping function to a first color channel of the pixel, the first color channel most closely matching relative luminance response of the human visual system, whereby a value of the first color channel is changed by a scale factor; and

applying the scale factor to all other color channels of the pixel.

2. The method of claim 1, wherein the color channels correspond to a positive linear color space.

3. The method of claim 1, further comprising adding noise balancing terms when computing scale factors for the other color channels.

4. A method of applying a tone-mapping function to a digital image represented in positive linear color space, the color space including an A_L channel and at least one A_k channel, the A_L channel most closely matching the relative luminance response of the human visual system, for each pixel the method comprising:

applying a tone mapping function to the A_L channel of each pixel to generate a tone-corrected relative luminance value A'_L for each pixel; and

transforming the A_k values of each pixel according to $A'_k = (A_k / A_L) \times A'_L$.

5. The method of method of claim 4, wherein a noise balancing term is added to each color channel, wherein the A_k color channels are transformed according to $A'_k = (A_k + A_{k(noise)}) / (A_L + A_{L(noise)}) \times A'_L$, where $A_{k(noise)}$ and $A_{L(noise)}$ are small positive numbers.

6. The method of claim 4, wherein the pixels are processed independently, whereby a scale factor is specific to each pixel.

7. The method of claim 4, wherein the color space is CIE tristimulus channels XYZ color space, wherein noise balancing terms X_{noise}, Y_{noise}, Z_{noise} are added to the color space and wherein the channels of the color space are modified as follows:

$Y'=TM(Y)$;

$X' = (X + X_{noise}) / (Y + Y_{noise}) \times Y'$; and

Z value of each pixel according to $Z' = (Z + Z_{noise}) / (Y + Y_{noise}) \times Y'$.

8. The method of claim 7, wherein the noise balancing terms are a triplet of numbers proportional to the white point of the CIE tristimulus channel system.

9. The method of claim 4, wherein the color space is RGB color space, wherein the channels are modified as follows:

applying a tone mapping function to the G channel of each pixel to generate a tone-corrected relative luminance value G' for each pixel;

transforming the R value of each pixel according to $R' = (R + R_{noise}) / (G + G_{noise}) \times G'$; and

transforming the B value of each pixel according to $B' = (B + B_{noise}) / (G + G_{noise}) \times G'$,

where R_{noise}, G_{noise}, B_{noise} are noise balancing terms.

10. The method of claim 9, wherein the noise balancing terms are a triplet of numbers proportional to the white point of the RGB color space.

11. Apparatus for processing pixels of a digital image, the apparatus comprising a processor for applying a tone mapping function to a first color channel of the pixels, the first color channel most closely matching relative luminance response of the human visual system, whereby values of the first color channels are changed by scale factors; and applying the scale factors to all other color channels of the pixels.

12. The apparatus of claim 11, wherein the digital image is represented in a positive linear color space.

13. The apparatus of claim 11, wherein the processor adds noise balancing terms when computing scale factors for the other color channels.

14. The apparatus of claim 11, wherein the pixels are processed independently, whereby a scale factor is specific to each pixel.

15. An article for a processor, the article comprising computer memory encoded with data for instructing the processor to apply a tone mapping function to a first color channel of a pixel of a digital image, the first color channel most closely matching relative luminance response of the human visual system, whereby a value of the first color channel is changed by a scale factor; the data further instructing the processor to apply the scale factor to all other color channels of the pixel.

16. The article of claim 15, wherein the digital image is represented in a positive linear color space.

17. The article of claim 15, wherein the data instructs the processor to add noise balancing terms when computing the scale factor for the other color channels.